



MARINA DEL REY HARBOR JUSTIFICATION REPORT FOR A SITE-SPECIFIC OBJECTIVE STUDY FOR DISSOLVED COPPER





PRESENTATION

1. TMDL Background and Water Quality Improvement Actions
2. State Implementation Policy Justification Report
3. Site Specific Objective Study Overview

TMDLS IN MARINA DEL REY



1. Toxics/Copper
2. Bacteria (Basins D, E & F)
3. Trash

TOXICS/COPPER TMDL

- TMDL – Total Maximum Daily Load
- Toxic Pollutants TMDL – First became effective in 2006 and was revised by the Regional and State Boards in 2014, approved by EPA in 2015

TOXICS/COPPER TMDL

- Revisions included a finding of copper impairment and a set Load Allocation for copper in the water column
- To meet the TMDL targets, there must be an 85% reduction of copper leaching from boat hull paints by 2024.

KEY SOURCES OF DISSOLVED COPPER IN THE MARINA

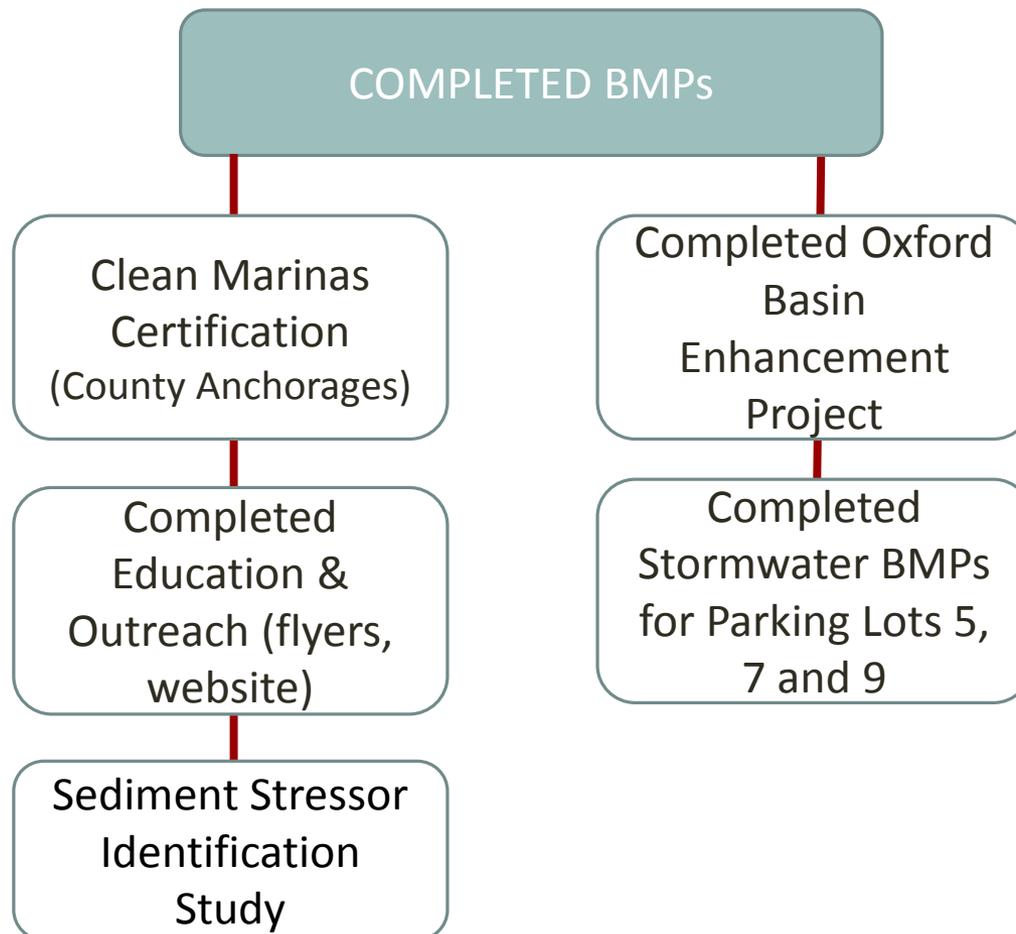
Passive Leaching of Hull Paint



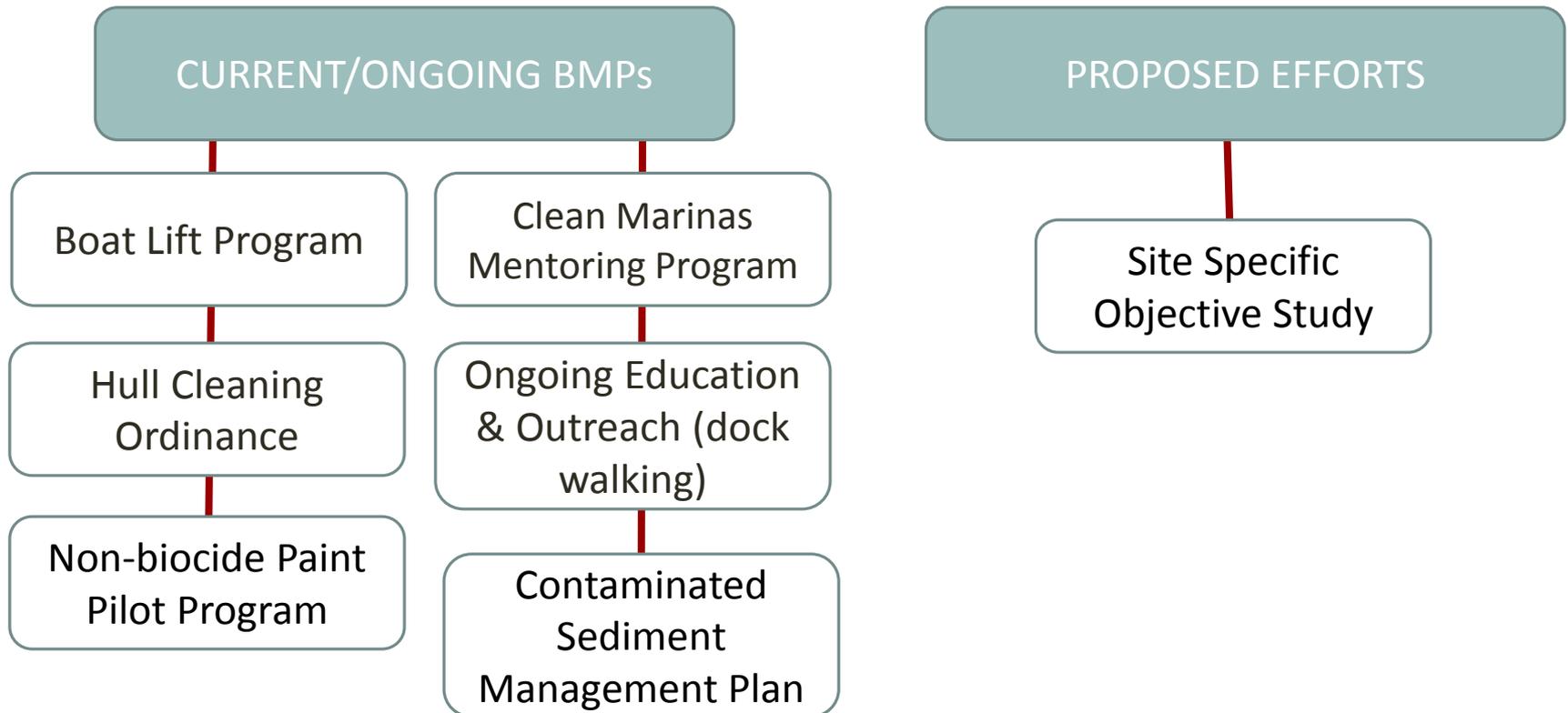
Hull Cleaning



EFFORTS TO ADDRESS TOXICS/COPPER TMDL



EFFORTS TO ADDRESS TOXICS/COPPER TMDL



TOXICS/COPPER TMDL: EDUCATION & OUTREACH



MARINA DEL REY HARBOR COPPER IMPAIRMENT FACTS

This fact sheet was developed to provide information to the Marina del Rey community on the water column copper impairment in Marina del Rey Harbor (MdrH).

Is marine life in Marina del Rey Harbor impaired due to water column copper?
 Yes. According to a study conducted by the California Department of Pesticide Regulation in 2009, dissolved copper levels in the water column are at nearly 14 times background levels as defined at local reference sites and far above the regulatory limits set by the California Toxics Rule of 11 micrograms per liter (ug/L) (see table below). The only site that exhibited healthy bivalve and mollusc that indicated that the copper concentrations in MdrH are at levels that are likely to be toxic to copper sensitive organisms.

Test Location	Range of Observed Copper (ug/L)	Local Reference Site	Median of Observed Copper (ug/L)	Regulatory Limit (ug/L)
Middle Beach Basins	8.9-16.2	0.3-0.7	3.8	1.1
Middle Beach Basins	8.1-18.4	0.3-0.7	3.6	1.1

Local reference site is a location expected to not just make the marine, but within the same bay.

In addition to the 2009 report, the Los Angeles Regional Water Quality Control Board reports that copper levels in MdrH exceed water column regulatory numeric targets. The data used here were developed to protect the environment and human health. The data used on County supplied data and is represented in the figure below with additional symbols for comparison purposes.

Disolved Copper (ug/L) in Marina del Rey Harbor

MARINA DEL REY HARBOR IN-WATER BOAT HULL CLEANING

Best Management Practices (BMPs)



FOOTING. SOURCE: L. PATTON, MPA (Ministry of Primary Industries)

Antifouling paints are used on boat hulls to slow the growth of marine organisms. The paints most commonly work in one of three ways: (1) slowly releasing a toxic chemical (biocide) from the hull coating; (2) slowly releasing the paint surface like a bar of soap over time (ablative coating); or (3) presenting a hard or slippery surface that makes it difficult for organisms to attach. Each type of paint has its own cleaning restrictions and requirements.

Another objective of implementing hull cleaning best management practices (BMPs) is to reduce the pollution generated during cleaning operations. The best way to accomplish this is to use the most aggressive cleaning method possible when performing in-water hull cleaning.

MARINA DEL REY HARBOR IS A BOAT LIFT RIGHT FOR ME?

Boat lifts are a great way to protect the hull of your boat from over the growth, corrosion, and other potential damages such as electrolysis. These devices greatly reduce or eliminate hull maintenance requirements such as in-water hull cleaning and periodic painting, which can save the boat owner money and extend the lifespan of the boat.

These devices greatly reduce or eliminate hull maintenance requirements.

An added benefit of boat lifts is they can be used as an alternative to copper leaching and other toxic antifouling paints. Because the lift raises the boat out of the water while docked at the slip, fouling is greatly reduced. Therefore, boat lifts can be used in conjunction with a non-toxic hull paint or no hull paint at all.

Types of Boat Lifts

Inflatable Collapsible Chambers

For these types of lifts, the boat sits on inflatable chambers that function like an industrial air mattress under the boat. The lift and boat sit on a floating frame (i.e., the lift has no permanent structure) in



Non-toxic boat lift

Inflatable Rigid Tanks

With this type of lift, the boat sits on an aluminum frame that is raised out of the water using air tanks. A newer style of lift is also called a floating frame lift, but the lift has no permanent structure from a standard structure) in



Non-toxic boat lift

HTTP://BEACHES.LACOUNTY.GOV/WATER-QUALITY/

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Caring for Your Coast Los Angeles County

MARINA DEL REY BEACHES RESERVATIONS PERMITS & LICENSES PARKING GOVERNMENT

ENVIRONMENT

WATER QUALITY

MARINA DEL REY HARBOR REGULATORY COMPLIANCE



NPDES COMPLIANCE

- Enhanced Watershed Management Plan
- Absorbent Pad Exchange
- Coordinated Integrated Management Plan
- Low Impact Development Standards
- Clean Marinas
- Green Infrastructure

Toxics TMDL

[TOXICS TMDL INFO](#)

Bacteria TMDL

[BACTERIA TMDL INFO](#)

Trash TMDL

[TRASH TMDL INFO](#)

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WATER QUALITY

Toxics TMDL



Marina del Rey Harbor is currently designated as an "impaired" water body on the 303(d) list issued under the 1972 Clean Water Act. The Clean Water Act established regulations and mechanisms to clean up the Nation's polluted waterways, which included provisions for Total Maximum Daily Loads (TMDLs). A TMDL puts a limit on the amount of pollutant a receiving water body can accept in order to protect its beneficial uses. In the Marina del Rey Harbor, a Toxic Pollutants TMDL was developed by the Los Angeles Regional Water Quality Control Board (Regional Board) to set limits on contaminants entering the harbor water column and sediment. The contaminants addressed in the Toxic Pollutants TMDL are summarized in the table below.

Media	Contaminants
Sediment	Copper, lead, zinc, chlordane, PCBs, total DDTs, and p,p'-DDE
Water Column	Dissolved copper and PCBs
Fish Tissue	Total PCBs

Dissolved copper is a major issue in the Marina del Rey Harbor as well as other marinas along the coast. The leading cause of dissolved copper pollution in marinas is from copper-based antifouling paints. Antifouling paints are used to prevent marine growth on surfaces, particularly boat hulls, yet the majority of these antifouling paints contain copper that leaches into the surrounding water causing pollution issues. The Toxics TMDL regulates the amount of copper going into the harbor.

The TMDL is enforced through the assignment of waste load allocations and load allocations by the Regional Board to different permittees. The permittees named in the TMDL include the County of Los Angeles, the City of Los Angeles, the City of Culver City, as well as the anchorages and boat owners in the Marina del Rey Harbor.

More information on the Marina del Rey Harbor Toxics TMDL can be found on the [Regional Board's website here](#).

TOXICS/COPPER TMDL: UPCOMING BMPS

Hull Cleaning Ordinance
(In Development)



Boat Lift Program
(Starts this Summer!)



SEDIMENT STRESSOR IDENTIFICATION STUDY



- Completed and submitted to the Regional Board in December 2016



Oxford Basin Project



- Water Quality Components constructed 12/31/15
- Additional Features constructed 5/26/16

Marina del Rey - Parking Lot 9



- Water Quality Components constructed 12/31/16
- Additional Features constructed 3/15/17

CONTAMINATED SEDIMENT MANAGEMENT PLAN



- Currently Developing Strategies to Meet Target Date
- Due to the Regional Board December 31, 2019

QUESTIONS?

- Next Presentation: State Implementation Policy Justification Report





STATE IMPLEMENTATION POLICY JUSTIFICATION REPORT

Shelly Anghera, Ph.D.
August 23, 2017



MARINA DEL REY TMDL

- Copper boat paint is the largest source of copper in the water
- Regional Board TMDL mandates reduction of copper by 85%
- The use of non-copper antifouling paints (AFPs) is growing and new paints continue to be developed



COUNTY TMDL IMPLEMENTATION

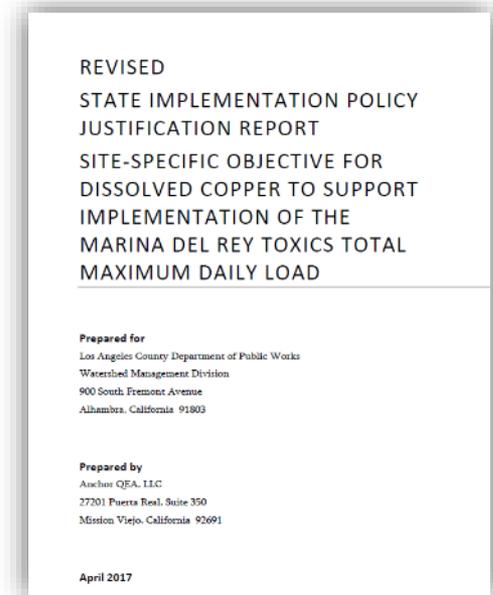
- Multiple ongoing activities are being implemented to restore and maintain water quality for the designated beneficial uses including reducing copper loading
- County has applied for grant funds to assist in funding copper-reducing BMPs
- County is implementing financial incentives to encourage the use of alternative antifouling strategies (e.g., paint conversion funding, boatlift funding) and investigating incentive-based lease agreements
- County is implementing a non-biocidal paint pilot program



State implementation policy Justification Requirement	Response	
Section 5.2(1): A written request for a SSO study	Letter and draft SIP Justification submitted	√
Section 5.2(2): Demonstration of exceedance to an existing WQ objective	Section 2: Monitoring data compared to the CTR numeric target for dissolved copper	√
Section 5.2(3)(a): Analysis of Compliance and Consistency with All Relevant Federal and State Plans, Policies, Laws, and Regulations	Section 3.1 <ul style="list-style-type: none"> • State & federal regulation review • Antidegradation review • Anti-backsliding review 	√
SIP Section 5.2(3)(b): Review of Historical Limits and Compliance with Those Limits	Section 3.2 <ul style="list-style-type: none"> • List of County activities 	√
SIP Section 5.2(3)(c): Review of Current Technology and Technology-based Limits	Section 3.3 <ul style="list-style-type: none"> • Antifouling paints • Mitigation measures • Feasibility to achieve TMDL compliance schedule 	√
SIP Section 5.2(3)(d): An Economic Analysis of Compliance	Section 3.4 <ul style="list-style-type: none"> • Regional and local cost analyses 	√

SIP JUSTIFICATION REPORT

- Section 5.2(1) through (3) contain technical and administrative information to meet requirements to initiate a SSO study
- Has satisfied the requirements to initiate the development of a site specific objective.
- This SSO study will provide needed information to support various implementation actions and to evaluate the success of those actions to reduce copper loading from boats.



THE COUNTY IS COMMITTED TO WATER QUALITY

- Currently working with the public to address alternative paint information gaps through notifications, workshops, and educational flyers
- Conducting public surveys to understand:
 - Boat paint use
 - Effectiveness of alternative AFPs
 - Cost and constraints of changing AFPs
- Conducting special studies to identify and support the most effective management strategies
- SSO study will help the County develop and identify efficient and effective implementation options to reduce dissolved copper discharge from boats in MdR Harbor.



QUESTIONS?

- Next presentation: Site Specific Objective Study Overview



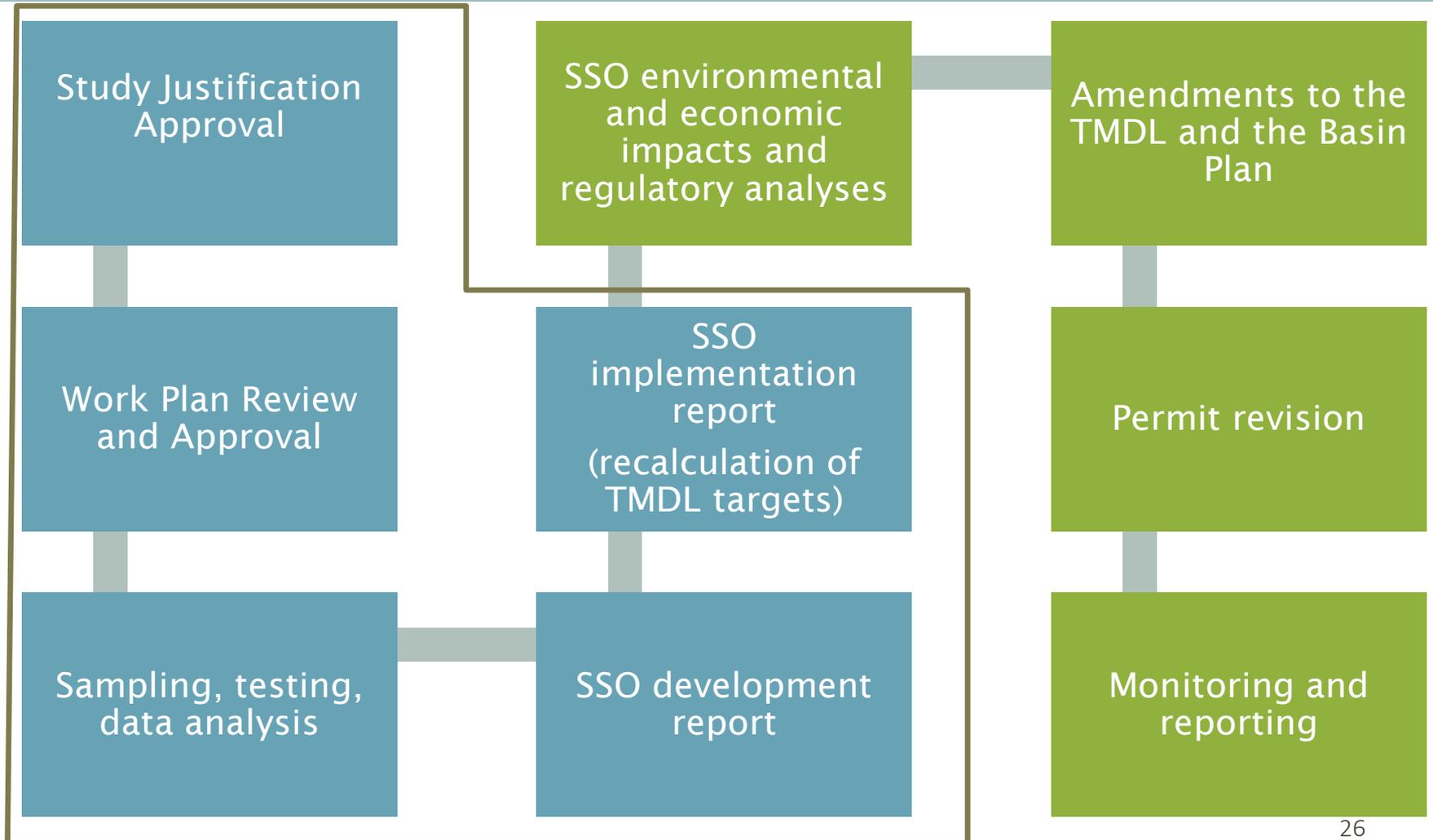
SITE SPECIFIC OBJECTIVE STUDY OVERVIEW

Steven Bay
Southern California
Coastal Water
Research Project
August 23, 2017

GOALS OF THE SSO STUDY

- Determine the copper threshold that is protective of marine life in MdRH in a scientifically sound manner
- Communicate study findings to regulators and stakeholders
- Develop implementation details needed to support consideration of SSO adoption into TMDL and Basin Plan

SSO DEVELOPMENT AND IMPLEMENTATION



EPA AND CALIF. RECOGNIZE POTENTIAL NEED TO CALIBRATE OBJECTIVES

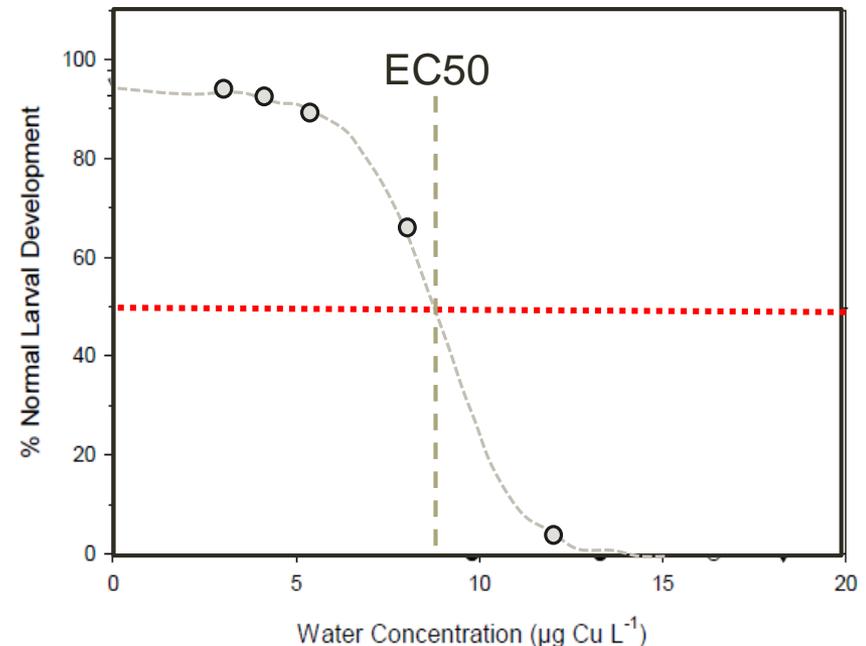
- Water quality objectives are established to be protective of aquatic life under a wide variety of environmental conditions
 - Based on standardized laboratory tests and conservative assumptions
- Objectives do not account for site specific environmental factors that affect toxic potency
 - Water chemistry differs among sites/habitats
 - May affect accuracy of objective
- EPA established guidelines for development of site specific objectives
 - Science-based process to evaluate objective
 - Adjustments maintain aquatic life protection

WATER EFFECT RATIO (WER)

- Scientific method to evaluate water quality objective accuracy
 - Compares toxicity of contaminant in site water to lab water

EC50 = Toxicant concentration causing 50% effect

$$\text{WER} = \frac{\text{Site Water EC50}}{\text{Lab Water EC50}}$$



WER INTERPRETATION

- $WER = 1$
 - Water quality objective accurate with respect to site conditions
- $WER > 1$
 - Site conditions reduce toxic potency
- $WER < 1$
 - Site conditions increase toxic potency
- Magnitude and consistency of WER used as part of basis to determine need for SSO
 - Adjustment factor to restore level of aquatic life protection to that intended by EPA

PREVIOUS CU SSO STUDIES

- Site water quality shown to affect copper toxicity in multiple studies
 - Los Angeles River and tributaries
 - Calleguas Creek and Malibu Lagoon
 - San Francisco Bay
 - San Diego Bay
- TMDLs and Basin Plans modified in several cases
 - Public process with external scientific review

MDRH STUDY OBJECTIVES

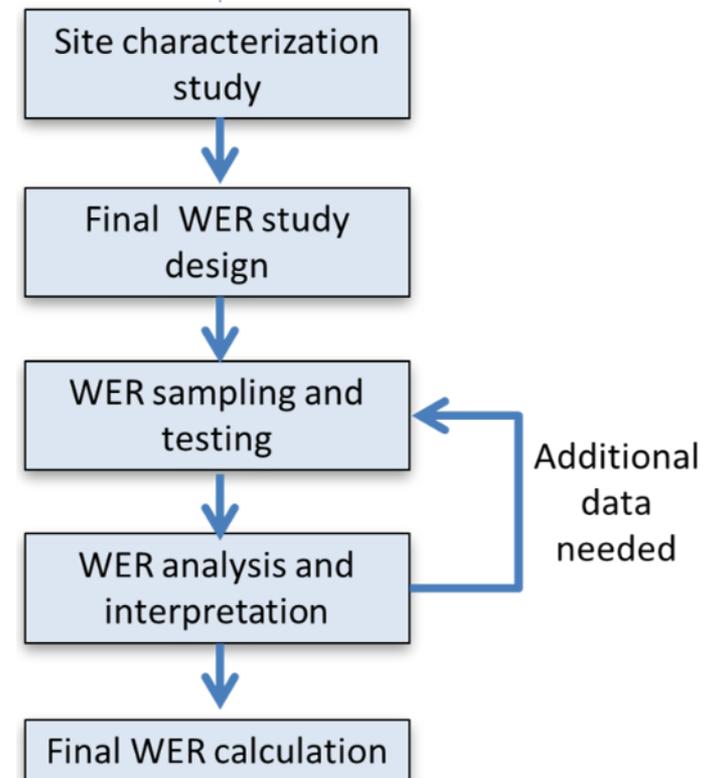
- Measure toxicity and water chemistry throughout harbor
 - Identify conditions when toxic potential of Cu is greatest
 - Use same toxicity test methods selected by EPA for calculating original water quality objective
- Calculate WER at multiple locations and times
- Document the effects of season, tide, and location
- Analyze the results to determine whether there is a scientific basis for a SSO
 - Statistical analysis of potential SSO values
 - Technical Advisory Committee review

TECHNICAL ADVISORY COMMITTEE

Name	Affiliation	Expertise
Peter Campbell	University of Quebec, INRS, Quebec, Canada	Trace metal analysis, speciation, toxicology, bioaccumulation
Gary Cherr	Bodega Marine Laboratory, University of California, Davis, CA	Reproductive physiology, developmental biology, environmental toxicology
Samuel Luoma	John Muir Institute of the Environment, University of California, Davis, CA	Metals bioavailability and ecological effects in aquatic environments
Robert Santore	Windward Environmental, Syracuse, NY	Metals bioavailability, site-specific criteria, chemical modeling, ecological risk assessment

DRAFT WORK PLAN

- Site characterization
 - Determine site factors to include in WER testing
- WER testing
 - Dose-response toxicity tests at multiple times and locations
- Analysis and interpretation
 - Calculate WERs
 - Assess scientific basis for SSO
 - Describe implementation options



COMMUNICATION AND REVIEW

- Draft work plan review
 - Public, Water Board, TAC
- Agency consultation meetings
 - Quarterly meetings with study partners
- TAC meetings
 - Scientific review and guidance at key phases of study
- Public workshops (2)
 - Explain study details and findings
 - Respond to stakeholder concerns

REPORTS

- Technical Report
 - Sampling and testing activities
 - Toxicity and chemistry data
 - Statistical evaluation WER results
 - Comparison to other studies
- Implementation Report
 - Environmental and economic impacts
 - Anti-degradation & anti-backsliding

NEXT STEPS (TENTATIVE)

- Complete study justification report review
- Review of draft work plan
 - Pending approval of justification report
 - Technical Advisory Committee meeting



QUESTIONS?

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